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## NOTES ON ICHTHYOLOGY

THE most imposing work in ichthyology for the year is Dr. C. H. Eigenmann's "Fresh Water Fishes of British Guiana," published in the *Memoirs of the Carnegie Museum*, No. 5. This paper contains a very full discussion of the different species of the region concerned, with synonymy and notes of various kinds. It is also accompanied by an excellent series of maps and figures, with an illuminating discussion of the fauna of British Guiana and northern Brazil. This paper is the result of a most important expedition made by Dr. Eigenmann under the auspices of the Carnegie Museum at Pittsburgh.

Another work of very great importance is the "Résultats des Campagnes Scientifiques" of Albert the First, Prince of Monaco. In Fascicule XXXV of this splendidly printed series, Dr. Eric Zugmayer gives the results of the work of the Yacht *Princesse-Alice* for the ten years from 1901 to 1910. Many species, old and new, are described, with a series of admirable plates representing deep sea fishes of the Mediterranean which the learned and indefatigable prince has brought to light.

In the *Ann. and Mag. Nat. Hist.*, 1912, Mr. C. Tate Regan discusses the relations of the various families of eels.

In another paper he discusses the relations of the Blennioid fishes which, following Gill, he divides into numerous families, the Brotulids with the Fierasfers and Zoarces being regarded as among these Blennioid families. In another paper Mr. Regan discusses the affinities of the Mailed Cheek fishes. Following Cuvier and Jespersen, he assigns the sticklebacks to this group, contrary to the views of all other recent systematists. I can not believe that the sticklebacks have any affinity with the mailed cheek fishes, the ossified skin on the cheek being an analogy only.

In another paper Mr. Regan discusses the hag fishes of the genus *Heptatretus*. The different groups characterized by the number of gill openings, ranging from 6 to 14, are not regarded as separate genera.

In another paper the anatomy of the Discocephali is under discussion. He regards these fishes, in spite of the singular sucking disc on the head, as allies of the perch-like fishes, perhaps not far removed from *Naucrates*.

In another paper Mr. Regan discusses the family of Caristiidae which he regards as allies of *Beryx*. He compares *Caristius* with *Platyberyx*, lately described by Zugmayer from Cape St. Vincent. He thinks that the two belong to the same genus and are perhaps not even specifically distinct. In this he is apparently wrong; *Platyberyx* seems related to *Beryx* but *Caristius* is, as I have already indicated, closely related to the Bramidae. It is still nearer to *Pteraclis* from which it is mainly distinguished by the short anal fin, the anal fin in *Pteraclis* being nearly as long as the dorsal fin. The species described from Japan by Bellotti, as *Pteraclis macropus*, belongs also to this group and is in fact a second species of the genus *Caristius*.

Regan also describes in *Ann. and Mag.* and in the *Proc. Biol. Soc.* a large number of species from the rivers of South America with valuable notes and figures.

In the *Records of the Canterbury Museum*, Edgar A. Waite gives additions and modifications of the basic list of the fishes of New Zealand.

In the *Trans. New Zeal. Inst.* are given a number of valuable notes on New Zealand fishes. The grotesque *Aegeonichthys apelli* of Clarke is figured and also the extraordinary *Oreosoma atlanticum*, which has not been seen since the original specimen of Cuvier. The fish has seven ventral rays like others referred to the family of Zeidae.

In the *Indiana University Studies*, 1912, Dr. Eigenmann describes a number of new species from the rivers of northern Colombia and in the *Ann. Carn. Mus.*, 1911, he describes numerous Characin fishes from rivers of northern South America.

In the *Proc. Linn. Soc. N. Y.*, Mr. J. T. Nichols gives a list of the fishes known to occur within fifty miles of New York, 237 in number, with figures of several.

In the *Bull. Amer. Mus. Nat. Hist.*, Mr. Nichols describes a new frog fish from Barbadoes, *Antennarius astroscopus*. He also gives a figure of the little known *Pseudomonacanthus amphioxys*.

In another paper Mr. Nichols gives notes on Cuban fishes. *Siphostoma torrei* and *Xystæma havana* are described as new.

In the *Proc. Biol. Soc. Wash.*, E. W. Gudger gives notes on fishes from Beaufort, North Carolina.

In the *Proc. Biol. Soc. Wash.*, T. D. A. Cockerell gives valuable notes on the scales of flounders, soles, codfish and other forms.

In the *Proc. U. S. Nat. Mus.*, Dr. C. H. Gilbert and C. V. Burke describe a number of new snail-fishes from the waters of Japan.

In the same proceedings Charles V. Burke describes additional species of snail-fishes or Liparids, including the new genus *Polypera* based on *Neoliparis greeni*. *Cyclogaster bristolense* is described from Bristol Bay, *C. megacephalus* from Bering Sea, *Careproctus gilberti* from Kadiak Island, *Paraliparis deani* from Alaska, *Paraliparis garmani* from New England and *Rhinoliparis attenuatus* from Bering Sea.

In the same proceedings Barton A. Bean and A. C. Weed describe an important collection of fishes from Java.

In the same proceedings Lewis Radcliffe describes 29 new species allied to the codfishes, from the Philippines. A new genus, *Macrouroides inflaticeps*, is made type of a distinct family.

In the same proceedings D. S. Jordan and C. W. Metz describe two new species from Hawaii.

In the same proceedings Professor J. O. Snyder enumerates the fishes collected by him in the Riu Kiu Islands, with numerous figures of interesting forms. The fauna of these islands is strictly tropical, in many regards not very different from that of Samoa but with some characteristic Japanese species.

In the same proceedings Professor Snyder enumerates the species obtained in the *Albatross* expedition of 1906 in the waters of Japan. Many new species are described and figured.

In the *Proc. Biol. Soc. Wash.*, B. W. Evermann and H. B. Latimer describe a collection obtained from the Olympic Peninsula in the state of Washington. In the proceedings of 1908 B. W. Evermann and W. C. Kendall describe and figure a European pipe fish, *Nerophis æquoreus*, obtained in the western Atlantic, the first American record of this species.

In the *Bull. Bur. Fish.*, 1910, Gilbert and Burke describe the fishes collected in Alaska by the steamer *Albatross* on its way to Japan. About forty new species were obtained in this expedition.

In the same bulletin W. C. Kendall describes a new flat fish from the Georges Bank, off New Foundland, under the name of *Pseudopleuronectes dignabilis*.

In the *Mitteil. Naturh. Mus. Hamburg*, 1912, Georg Duncker discusses the genera of the pipe fishes.

In the *Ann. Mus. Zool. Univ. Napoli*, J. Pellegrin describes fishes in the Museum of Naples, mostly obtained by an expedition to the Red Sea.

In the Report of the British Antarctic Expedition of Shackleton, Mr. Edgar R. Waite describes the fishes taken in the Antarctic, four species only, all of the family of Nototheniidae.

In the *Bull. Americ. Mus. Nat. Hist.*, L. Hussakof describes eight Chimæroids of the Cretaceous of North America.

In the *Ann. N. Y. Acad. Sci.*, R. D. O. Johnson describes an extraordinary climbing catfish, *Arges marmoratus*, from Colombia. In connection with this, Dr. Bashford Dean remarks that "it is hardly to the credit of our cloth that these observations on fishes should be first made by a mining engineer."

In the *Zoologischen Anzeiger*, 1912, Dr. L. F. de Beaufort describes new Gobies from Ceram and Waigeu.

In the *Zool. Jahrb.*, L. S. Berg describes the origin of the fishes of the basin of the river Amur.

Under the title of "Faune de la Russie," Dr. Berg describes and catalogues the fishes of Russia, a valuable paper, accompanied by good descriptions, which unfortunately for most of us are mainly in Russian.

In the *Bull. Mus. d'Hist. Nat. Paris*, 1912, Dr. Pelligrin enumerates fishes from the New Hebrides with the description of *Callechelys guichenoti*, hitherto imperfectly known.

In the *Bull. Inst. Oceanog.* of the Prince of Monaco, Dr. Zugmayer describes numerous deep-sea fishes obtained by the prince.

In the *Bull. Soc. Zool. de France*, 1912, Dr. Louis Fage describes a collection of fishes from the coast of Morocco.

Under the head of "Figures and Descriptions of the Fishes of Japan," Mr. Shigeho Tanaka, lecturer in the Imperial University, continues his series of excellent descriptions and figures of Japanese fishes, the text being both in Japanese and in English. Of this series ten fascicules have been published. When it is finished it will give a most complete and valuable account of the fishes of Japan. No attempt is made to classify these species, one being taken up after another in the order which the author finds most convenient, a matter of necessity under the circumstances of publication.

In the *Journal Coll. Sci. Imp. Univ. Tokyo*, H. Ohshima describes in detail the luminous organs of various fishes, among them the small deep-water sharks of the coast of Japan.

In the *Proc. Roy. Soc. Queensland*, A. R. McCulloch describes some new Atherinidæ from Australia.

In the *Rec. West. Austr. Mus.*, Mr. McCulloch publishes notes on various fishes from western Australia.

In the Records of the Canterbury Museum, Mr. Waite describes the many species, some of them of remarkable interest, obtained by the trawling expedition of New Zealand.

In the *Revue Institute d'Agronomie*, Montevideo, Professor André Bouyat gives popular accounts in Spanish, with photographs, of the principal food fishes of the coast of Uruguay.

In the *Zoologischen Anzeiger*, George Wagner discusses the possibility of the existence of the species of Gar pike described from a Chinese drawing under the name of *Lepisosteus sinensis*. No naturalist has ever found a gar pike in China and the question of where this specimen was obtained from which this drawing is made is still uncertain.

In the *Bull. Soc. Zool. de France*, Mr. F. Priem describes the fossil fishes of the Argentine Republic.

In the *Field Mus. Nat. Hist.*, Dr. Seth E. Meek describes new fishes of numerous species from the rivers of Costa Rica. Dr. Meek and S. F. Hildebrand also describe a number of new species from Panama.

In the *Trans. Amer. Fish Soc.*, at St. Louis, are numerous valuable papers relating chiefly to the culture or to the diseases of fishes. One of the many papers of practical value is an account of the fur seal herd of the Pribilof Island and the prospects for its increase, by C. H. Townsend. The sole cause of the reduction in numbers of these animals has been the killing of females at sea, known as pelagic sealing. In the early Russian days before the present methods of removing the bristles from seal skins, leaving the soft underfur, was discovered in London, the most valuable fur was that of the young animals at the age of four months when they change the black coat for the silver gray of the first year. In those days these silver-gray pups were killed indiscriminately on land without regard to sex, a matter which naturally rapidly reduced the herd. But so long as the females are protected, both on land and sea, there is no reason why the herd should not enormously increase, probably in time with proper management on the land, so as to yield even more than the 100,000 skins of superfluous males which were taken each year during the lease of the Alaska Commercial Company.

In the *Publ. Leland Stanford Jr. Univ.*, Professor E. C. Starks describes the skeletons of various families of mackerel-like fishes. In a general way he finds that the real relations of these forms, as indicated by their skeletons, correspond very nearly to the impressions made by their external characters. Among other things there is no immediate relation between the genus *Gerres* and the genus *Leiognathus*. These have some superficial resemblances, and have been placed in the same family by Dr. Boulenger.

In the Bureau of Fisheries documents Dr. G. H. Parker discusses the effect of explosions of motor boats and guns on fishes. These sounds under water are extremely faint and have little effect on the animals. Some of the noises made by the fishes themselves seem to have a certain attraction to others of their kind.

In the Biennial Report of the Commissioners of Fisheries of Wisconsin is a valuable discussion of the brook trout disease in the hatcheries of Wisconsin, the disease in this case being due to a parasitic crustacean, a small copepod, *Lernaeopoda edwardsii*. This creature is a parasite on the eastern brook trout but not on the other species of trout reared in Wisconsin. The best remedy seems to be to clean up the hatcheries, scraping the ponds, and introducing the sand filter. It is also suggested that the old trout, most usually affected, be got rid of early and that the copepods may be drawn apart by means of electric lights.

In the *Bull. Bur. Fisher.*, G. H. Parker discusses the sense structures of a small shark.

In the *Fishing Gazette*, Dr. Hussakof describes the spoonbill cat fishery of the lower Mississippi.

Under the head of Dogfish, D. E. Lane, of Bellingham, Washington, attempts to show that the species of *Squalus* have a great commercial value, the oil from the livers being capable of many uses through purification, and the bodies susceptible of being made into a high-grade fertilizer.

In the *Zool. Soc. Bull.*, F. B. Sumner describes in detail the adaptive colors among fishes and the changes which some of them undergo. In a certain species of turbot from the Bay of Naples marked all over in life with gray and dark spots of different shades and sizes, it is found that this fish placed on different bottoms adapts itself not only to the general color tone, but to the texture and pattern as well.

In the *Bull. Inst. Oceanog.*, Dr. Fage discusses the attempts to introduce the salmon in the Mediterranean, thus far unsuccessful.

In several papers in the *Anatomischen Anzeiger*, E. P. Allis, Jr., describes the blood vessels and other structures of many species of sharks and other fishes.

In the *Proc. 7th Internat. Zool. Cong.*, Professor H. F. Nachtrieb describes the lateral line of the paddlefish. Another paper is in the *Journal of Experimental Zoology*.

In the *Bulletin* of the Bureau of Fisheries, XXXII, for 1912, under the head of "The Age at Maturity of the Pacific Salmon of the Genus *Oncorhynchus*," Dr. Charles H. Gilbert gives a detailed account of his investigations of the scales of the salmon, following a method begun by Johnston in his studies of the salmon of Scotland. In this paper he shows that the age of the salmon can be determined by its scales and because the salmon of the Pacific Coast runs periodically, this information thus secured may be of great commercial importance. A few years ago a similar study was undertaken by Professor J. P. McMurrich. Unfortunately this work, which was otherwise well done, rested on an initial mistake. The red salmon, which was taken by him to be a four-year old, was actually five years of age.

Summing up, Dr. Gilbert presents the following conclusions:

1. The sockeye spawn normally either in their fourth or fifth, the king salmon either in their fourth, fifth, sixth or seventh year, the females of both species being preponderatingly four-year fish.

2. The young of both sockeye and king salmon may migrate seaward shortly after hatching, or may reside in fresh water until their second spring. Those of the first type grow more rapidly than the second, but are subject to greater dangers and develop proportionately fewer adults.

3. Coho salmon spawn normally only in their third year. The young migrate either as fry or yearlings, but adults are developed almost exclusively from those which migrate as yearlings.

4. Dog salmon mature normally either in their third, fourth or fifth years, the humpback always in their second year. The young of both pass to sea as soon as they are free swimming.

5. The term "grilse," as used for Pacific salmon, signifies conspicuously undersized fish which sparingly accompany the



spawning run. They are precociously developed in advance of the normal spawning period of the species. So far as known, the grilse of the king salmon, coho and dog salmon are exclusively males, of the sockeye, almost exclusively males, except on the Columbia River, where both sexes are about equally represented. The larger grilse meet or overlap in size the smaller of those individuals which mature one year later at the normal period.

6. Grilse of the sockeye are in their third year, of the king salmon in their second or third year, of the coho and the dog salmon in their second year.

7. The great differences in size observed in spawning runs are closely correlated with age, the younger fish averaging constantly smaller than those one year older, though the curves of the two may overlap.

This article is also printed in the *Pacific Fisherman*.

F. L. Landacre in the *Jour. Comp. Neur.* discusses certain ganglia of the gar pike and their relations and significance.

In the *Bur. Fish. Doc.*, A. B. Alexander discusses the halibut fishing grounds of the Pacific Coast.

In the *Rapp. Cons. Internat. de la Mer*, Professor D. W. Thompson, of Dundee, describes the distribution of the cod and haddock.

In the *Bull. Soc. Géol. de France*, Mr. Priem discusses the fossil fishes of the Upper Tertiary in southern France and also the Mesozoic fishes of the same region.

In the *Bull. Amer. Mus.*, Dr. Hussakof describes a sawfish embryo.

In the *Bull. Bur. Fish.*, Professor J. O. Snyder describes under the name of *Salmo regalis*, the royal silver trout of Lake Tahoe. It is one of the most remarkable of the many American species of trout, being of beautiful steel blue and silver with very few spots. It is probably older and more primitive than any of the other trout, doubtless being part of the original fauna of Lake Lahontan.

DAVID STARR JORDAN.